[2] Green, C. V., "Further Evidence of Linkage in Size Inheritance," *Amer. Nat.*, 67, 377–380 (1933).

[3] "A Further Study of Size Inheritance in Rabbits, with Special Reference to the Existence of Genes for Size Characters," *Jour. Exp. Zoöl.*, 53, 421–454 (1929).

A HYPERTRAGULID FROM THE SESPE UPPERMOST EOCENE, CALIFORNIA

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Introduction.—It becomes increasingly clear that the faunal stage represented at Locality 150 in the Sespe deposits north of the Simi Valley, California, marks an advance beyond the stage or stages recorded lower in the stratigraphic sequence of the Sespe as exposed in this region. Determination of age of this fauna as Eocene is maintained for the reasons stated in the first paper[1] announcing the discovery of Eocene mammals in California. Future survey of the fauna as a whole and recognition of relationships of the assemblage to comparable faunas found elsewhere may contribute toward elevating rather than toward depressing the fauna in the geologic time scale. It suffices for the present to state that the assemblage appears to be close to or within the Eocene-Oligocene transition period in the Tertiary history of vertebrate life for North America. In order to distinguish this stage from the upper Eocene fauna or faunas occurring lower in the Sespe section, the age designation uppermost Eocene is now applied to the assemblage.

The following mammals from Locality 150 have been specifically determined:

Hyænodon vetus
Hyænodon (Protohyænodon) exiguus
Pterodon californicus
Pleurocyon (Simidectes) merriami
Chumashius balchi
Amynodontopsis bodei

To this list is now added a hypertragulid related to the Oligocene genus *Hypertragulus*.

FAMILY HYPERTRAGULIDAE

Simimeryx hudsoni, n. gen. and n. sp.

Type Specimen.—Fragment of palate with $P\underline{2} - M\underline{3}$, No. 1764 C.I.T. Vert. Pale. Coll., plate 1, figures 1, 1*a*.

Paratype.—Ramus of mandible with $P\overline{1} - M\overline{3}$, No. 1244 C.I.T., plate 1, figures 2, 2*a*.

Referred Specimen.—A fragment of the maxillary with $P\underline{3}$ and $P\underline{4}$, No. 1354, plate 1, figure 3.

Locality.—Sespe deposits, north of the Simi Valley, Ventura County, California, Locality 150 C.I.T. Vert. Pale.

Generic and Specific Characters.—Molar teeth with shorter crowns than in *Hypertragulus*. Upper molars with anterior intermediate cusp (protoconule); parastyle prominent and broadly rounded, not compressed anteroposteriorly as in *Hypertragulus*. Mesostyle absent, but external cingulum present. Internal cingulum present at base of posterior crescent in $M\underline{1}$ and $M\underline{2}$. Shelf present on inner side of molar teeth between inner crescents, but no pillar. Inner cusp on $P4$ not crescentic. $P\overline{2} - P\overline{4}$ form a closed series. $P\overline{4}$ with shallow posterior basin. Size near that of *Hypertragulus calcaratus* or smaller. The species is named for Dr. Frank S. Hudson of the Shell Company of California, who directed my attention to the Sespe deposits as exposed north of the Simi Valley.

Comparisons.—Remnants of the palate in the type specimen show the position of a palatine foramen opposite the posterior half of $P\underline{3}$. Three upper premolars are present in the type specimen, although $P\underline{3}$ is imperfectly preserved. The premolars are distinctly more like those of *Hypertragulus* than like those of *Leptomeryx*. $P\underline{2}$ is reduced in size and, as in *Hypertragulus*, has a simple laterally compressed crown. $P\underline{3}$ is complete in the referred specimen, No. 1354. The external surface of this tooth does not show quite so well marked a groove or concavity posterior to the principal cusp. However, the concavity is much better defined in the type specimen, No. 1764, than in No. 1354. The tooth is wider transversely and the inner cuspule is more distinct than in *Hypertragulus*. Moreover, the anterior basal tubercle is better developed than in the latter. In $P\underline{4}$ the posterior cingulum extends well around on the inner side of the base of the inner cusp and may actually encircle the inner side as in the referred specimen, No. 1354. Although the posterior wing of the inner cusp may be but feebly developed in *Hypertragulus*, it is absent in *Simimeryx* and there is a distinctly less tendency in the latter to outline a fossette between the opposed walls of the outer and inner cusps than in the Oligocene genus.

In each of the upper molars, the transverse diameter measured across the protocone is distinctly greater than that across the posterior crescent, and this feature becomes progressively more marked from the first to last molar, inclusive. The crowns of these teeth are strikingly like those in *Hypertragulus* with some noteworthy exceptions. Distinctly primitive features, in which the molars differ from those of the Oligocene genus, are (1) shorter crowns and (2) presence of a protoconule. This tiny but well marked cuspule is present on each of the molars in the type specimen. As

in *Hypertragulus*, a mesostyle is absent. In this respect *Simimeryx* differs from *Leptomeryx* and from *Bunomeryx*. The parastyle forms a broadly rounded, antero-external pillar, which differs noticeably in shape from the compressed style seen in *Hypertragulus*. The parastyle connects with the anterior crest extending outward from the antero-internal cusp as in the Mongolian genus *Archæomeryx*.

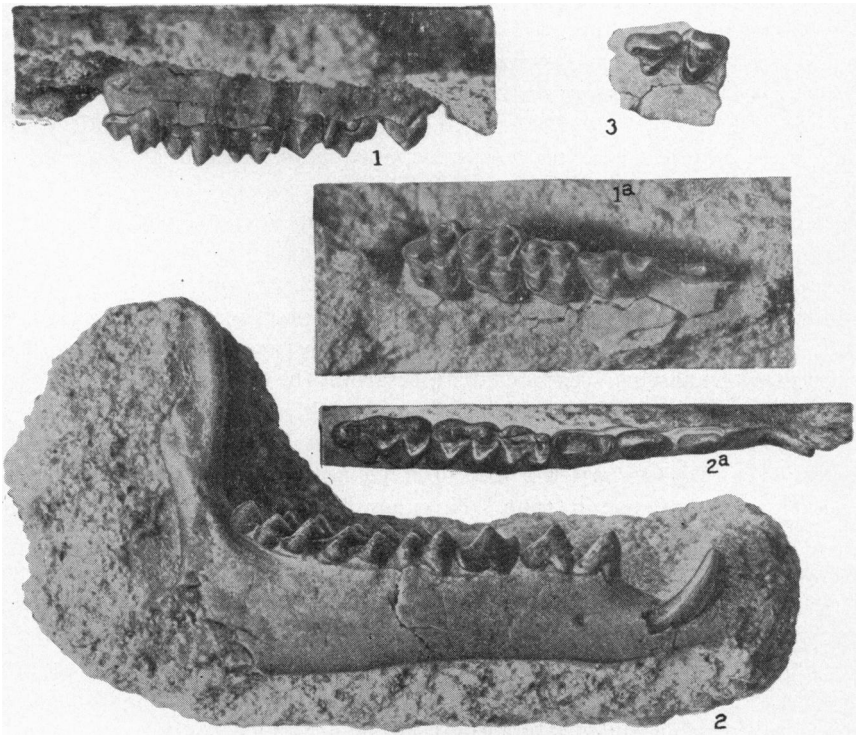

PLATE 1

Simimeryx hudsoni, n. gen. and n. sp.

Figures 1, 1*a*, type specimen, fragment of maxillary with $P\underline{2} - M\underline{3}$, No. 1764; lateral and occlusal views; × 1½.

Figures 2, 2*a*, paratype, right ramus with $P\overline{1} - M\overline{3}$, No. 1244; lateral and occlusal views; × 1½.

Figure 3, referred specimen, fragment of maxillary with $P\underline{3}$ and $P\underline{4}$, No. 1354; occlusal view; × 1½.

California Institute of Technology Collections. Sespe Uppermost Eocene, California.

In the ramus of the mandible an anterior mental foramen is situated beneath $P\overline{2}$ and a posterior foramen may be present below $P\overline{4}$. Unfortunately, with the exception of the lower caniniform tooth, nothing is known concerning the anterior teeth. As in *Hypertragulus*, a diastema separates

$P\overline{2}$ from a caniniform tooth in front of it, but this hiatus in the tooth-row is not so great as in the Oligocene form. The three posterior premolars form a closed series in *Simimeryx*, whereas in *Hypertragulus* $P\overline{2}$ is separated from $P\overline{3}$ by a short diastema. One may infer, perhaps, from the lack of spacing of the second lower premolar that the snout in the Sespe form was not so long as in *Hypertragulus*. $P\overline{2}$, as viewed from the external side, resembles that tooth in *Hypertragulus*. In $P\overline{4}$ the anterior crest extending downward and forward from the principal cusp turns inward and terminates in an antero-internal pillar. On the specimens available showing this tooth no separation is seen between the principal cusp and an internal accessory cusp. These two cusps are closely joined, if indeed the latter is present at all. Only a slight separation is evident in *Hypertragulus*, but in *Leptotragulus* a distinctly formed inner cusp is present. In *Simimeryx* the posterior portion of the crown forms a shallow basin which is bordered on three sides by crests. In *Leptotragulus* the rim bordering the basin may be more strongly developed and a minute spur projects into the basin. The external crescents of the lower molars exhibit less tendency to join with the inner cusps. Thus, for example, the posterior wing of the postero-external cusp remains distinct from the posterior ridge of the postero-internal cusp in moderately worn teeth, while in *Hypertragulus* a firm union has been established between the two at this stage. Similarly, the inner wall of the posterior lobe in $M\overline{3}$ is not joined firmly with the posterior crest of the cusp in front. No inner cusp is present on the inner rim of the posterior lobe in $M\overline{3}$ as in *Leptotragulus*.

Relationships.—The characters presented in the dentition of *Simimeryx* strongly suggest a position for this genus in or near the line of development leading toward *Hypertragulus*. The occurrence of the Sespe type in the sequence of Tertiary faunal stages accords with this view. Although relationship to the Oligocene and lower Miocene genus is apparent, the relationships of *Simimeryx* to earlier Eocene artiodactyls are more difficult to establish on the basis of present information.

The upper molars in the Uinta genus *Bunomeryx* possess a mesostyle. Among the several genera described by Peterson[2] from the Uinta, *Hylomeryx* does not appear to have any special relationship to our type. *Sphenomeryx* resembles *Simimeryx* in absence of mesostyle in upper molars but differs in presence of a reduced parastyle in these teeth, as well as in the farther posterior position of the inner cusp in $P\underline{3}$. *Mesomeryx*, on the other hand, appears to make a closer approach to the Sespe genus. However, the following differences are noted when *Simimeryx* is compared with this form: (1) in $P\underline{3}$ the inner cusp is farther removed from the principal cusp and is much better defined. As a result the basal outline of the tooth is wholly different. Moreover, the principal cusp is farther removed from the anterior end of the tooth. (2) A greater discrepancy in size exists be-

tween the inner and outer cusps in $P\underline{4}$; (3) The molars have a different shape, being longer anteroposteriorly with reference to their width. Furthermore, the inner anterior corner in these teeth is more prominent. The molars in the Uinta genus are described as being rather more selenodont than bunodont. In *Simimeryx* the anterior crest of the anterointernal cusp extends toward and is connected with the parastyle, whereas in $M\underline{1}$ and $M\underline{2}$ of *Mesomeryx* such a connection is not established. Although a protoconule has not been recognized in the type specimen of *Mesomeryx*, it is possible that this cuspule has been obliterated through wear.

Archæomeryx of the later Eocene Shara Murun formation, Mongolia,[3] resembles the Sespe type rather closely in stage of evolution of the cheek-teeth. Significant differences in the upper molar dentition are (1) presence of a mesostyle and (2) absence of the anterior intermediate cusp (protoconule). Less resemblance to the Californian form is displayed by the species of *Lophiomeryx* and *Miomeryx*, described from the Ardyn Obo of Mongolia.[4]

MEASUREMENTS (IN MILLIMETERS)

	Simimeryx hudsoni, n. gen. and n. sp. Type No. 1764 C.I.T.
Length from anterior end of $P\underline{2}$ to posterior end of $M\underline{3}$	28.7
Length from anterior end of $P\underline{2}$ to posterior end of $P\underline{4}$	13.6
Length of molar series from antero-external corner of $M\underline{1}$ to postero-external corner of $M\underline{3}$	15.7
	Simimeryx hudsoni, n. gen. and n. sp. Paratype No. 1244 C.I.T.
Length from anterior end of $P\overline{1}$ to posterior end of $M\overline{3}$	42.4
Length from anterior end of $P\overline{2}$ to posterior end of $M\overline{3}$	33.8
Length of diastema in front of $P\overline{2}$	4.9
Length from anterior end of $P\overline{1}$ to posterior end of $P\overline{4}$	22.9
Length of molar series	19.5
Depth of ramus below anterior end of $M\overline{3}$	10.3
Depth of ramus below anterior end of $P\overline{2}$	7.3

[1] Stock, C., *Proc. Nat. Acad. Sci.*, **18**, 523 (1932).
[2] Peterson, O. A., *Ann. Carnegie Mus.*, **12**, 66–75, pls. 36–37 (1919).
[3] Matthew, W. D., and Granger, W., *Amer. Mus. Nov.*, No. 196 (1925).
[4] Matthew, W. D., and Granger, W., *Ibid.*, No. 195 (1925).